

What is claimed is:

1. A differential apparatus comprising:  
pinion shafts radially arranged on a rotary member;  
pinions rotatably supported on the pinion shafts  
5 respectively;

a pair of side gears meshing with the pinions, and  
disposed coaxially with the rotary member, and

a junction, at which the pinion shafts are connected  
to each other by themselves.

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2. The differential apparatus according to claim 1, wherein  
the junction includes a first connecting wall that is formed  
between the pinion shafts being adjacent each other in a  
rotational direction of the rotary member, and the first  
15 connecting wall restricts an axial movement of one of the pinion  
shafts relative to the other of the pinion shafts.

3. The differential apparatus according to claim 1, wherein  
the junction includes a second connecting wall that is formed  
20 between the pinion shafts being adjacent each other in a  
rotational direction of the rotary member, and the second  
connecting wall restricts a rotational movement of one of the  
pinion shafts relative to the other of the pinion shafts.

25 4. The differential apparatus according to claim 1, wherein  
at least one of the pinion shafts is formed symmetry to a rotational

axis of the rotary member.

5. The differential apparatus according to claim 1, wherein the pinion shafts comprise:

5 a long pinion shaft, and

a short pinion shaft connected with the long pinion shaft at right angle thereto.

6. The differential apparatus according to claim 5, wherein  
10 the long pinion shaft includes a concave portion.

7. The differential apparatus according to claim 5, wherein  
the long pinion shaft has a hole, and said short pinion shaft  
has a projection formed on its axial end, and wherein the  
15 projection is inserted in the hole so that the long pinion  
shaft and the short pinion shaft are connected to each other.

8. The differential apparatus according to claim 5, wherein  
the long pinion shaft has a small diameter portion, and the  
20 short pinion shaft has an arcuate groove formed at its axial  
end, and

wherein the arcuate groove contacts a peripheral surface  
of the small diameter portion.

25 9. The differential apparatus according to claim 5, wherein  
a pair of grooves, including bottom surfaces, are formed in

the long pinion shaft, and

wherein the bottom surfaces of the pair of grooves contact axial end surfaces of the short pinion shafts.

5 10. The differential apparatus according to claim 1, wherein the rotary member includes an outer rotary member and an inner rotary member,

the inner rotary member is movably fitted in the outer rotary member and capable of being connected with and  
10 disconnected from the outer rotary member by a clutch tooth, and

the pinion shafts are radially arranged on the inner rotary member.

15 11. The differential apparatus according to claim 1, wherein a clutch tooth is provided on at least one of the side gears and capable of being connected with and disconnected from the rotary member.

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